

CLAIMS

- 1 A functional molecular element using a system in which anisotropy of dielectric constant is changed by molecular structure change induced by electric field.
- 2 The functional molecular element according to claim 1,
 the functional molecular element consisting of complex of organic molecule having anisotropy of dielectric constant or dipole moment and including side chains each of which structure is changed under application of electric field, and metallic ion.
- 3 The functional molecular element according to claim 2,
 wherein the side chain takes normal (straight) chain shape, and is bonded to substantially the disc-shaped organic molecule.
- 4 The functional molecular element according to claim 3,
 wherein liquid crystal solution of organic metallic complex molecule consisting of the organic molecule having the side chains is disposed between at least opposite electrodes in the state where orientation of the organic metallic complex molecule is performed on an electrode for applying electric field, and an output corresponding to the electric field is taken out from at least one electrode of the opposite electrodes.
- 5 The functional molecular element according to claim 4,
 wherein a columnar arrangement structure in which the organic

metallic complex molecules are arranged in a column form is formed between the pair of opposite electrodes.

6 The functional molecular element according to claim 4,

wherein the structure of the organic metallic complex molecule is changed by change of the electric field exerted on the organic metallic complex molecule so that an angle that the major axis direction of dielectric constant tensor and formation plane surface of the pair of opposite electrodes form is changed.

7 The functional molecular element according to claim 5,

wherein an insulating layer is provided on a first electrode for applying the electric field, a second electrode and a third electrode are formed, as the opposite electrodes, on the insulating layer so that they are not in contact with each other, the columnar arrangement structure is disposed between at least these second and third electrodes, and a fourth electrode for applying the electric field is provided on the columnar arrangement structure directly or through an insulating layer.